

**CLAIMS**

1. A nutraceutical for use in the treatment of inflammatory conditions comprising docosahexaenoic acid or an ester thereof and at least one carotenoid.
- 5 2. The nutraceutical according to Claim 1 wherein the ester of docosahexaenoic acid is selected from the group consisting of: a triglyceride, diglyceride, monoglyceride, phospholipids, glycolipid, sphingolipid or sulpholipid.
3. The nutraceutical of Claims 1 or 2 wherein said docosahexaenoic acid is provided as an algae or fraction thereof.
- 10 4. The nutraceutical of Claim 3 wherein said algae is selected from the group consisting of: *Crypthecodinium*; *Phaedactylum*; *Isochrysis*; *Schizochytrium*; *Thaustochytrium*; or *Ulkenia*.
5. The nutraceutical of Claims 1 or 2 wherein said docosahexaenoic acid is provided as a fish oil or fraction thereof.
- 15 6. The nutraceutical according to any of Claims 1-5 wherein said carotenoid is selected from the group consisting of astaxanthin, zeaxanthin, lycopene, lutein, or carotene.
7. The nutraceutical according to any of Claims 1-6 wherein said carotenoid is from a microbial source.
- 20 8. The nutraceutical according to Claim 7 wherein said microbe is *Haematococcus* or *Pfaffia*.
9. The nutraceutical according to any of Claims 1-8 wherein said docosahexaenoic acid is provided to an animal at a dose of between 0.05 and 500 mg/kg body weight and said carotenoid is provided at a dose of between 0.5 and 5,000 ug/kg body weight.
- 25 10. The nutraceutical according to any of Claims 1-8 wherein said docosahexaenoic acid is provided to an animal at a dose of between 0.5 and 15 mg/kg body weight and said carotenoid is provided at a dose of between 1.5 and 150 ug/kg body weight.

11. The nutraceutical according to any of Claims 1-8 wherein said docosahexaenoic acid is provided to an animal at a dose of between 1 and 3 mg/kg body weight and said carotenoid is provided at a dose of between 7.5 and 22.5 ug/kg body weight.
- 5 12. The nutraceutical according to any of Claims 1-11 wherein said composition further comprises yeast.
13. The nutraceutical according to any of Claims 1-12 wherein said composition further comprises an anti-inflammatory agent.
- 10 14. The nutraceutical according to Claim 13 wherein said further anti-inflammatory agent is selected from the group consisting of: vitamin C, vitamin E, lycopene,  $\beta$ -carotene, lutein, organic selenium,  $\alpha$ -lipoic acid, methylsulfonylmethane, glutathione, taurine, glycine, glutamine, arginine, cysteine, methionine, S-adenosylmethionine, nucleotides, nucleic acids, curcumin, green tea extract, green-lipped mussel extract (*Perna canaliculus*),  
15 or standardised herbal extracts such as *Phyllanthus amarus*, *Fructus Schisandra*, Chamomile, Blackcurrant leaf, Devil's claw.
- 20 15. The nutraceutical according to any of Claims 1-14 wherein said inflammatory condition is selected from the group consisting of: inflammatory joint diseases e.g. rheumatoid arthritis, osteoarthritis, polyarthritis and gout; chronic inflammatory connective tissue diseases e.g. lupus erythematosus, scleroderma, Sjorgen's syndrome, poly- and dermatomyositis, vasculitis; mixed connective tissue disease (MCTD), e.g. tendonitis, synovitis, bacterial endocarditis, osteomyelitis and psoriasis; chronic inflammatory lung diseases e.g. chronic respiratory disease, pneumonia, fibrosing alveolitis, chronic  
25 bronchitis, chronic obstructive pulmonary disease (COPD), bronchiectasis, emphysema, silicosis and other pneumoconiosis and tuberculosis; chronic inflammatory bowel and gastro-intestinal tract inflammatory diseases e.g. ulcerative colitis and Crohn's disease; chronic neural inflammatory diseases e.g. chronic inflammatory demyelinating polyradiculoneuropathy, chronic  
30 inflammatory demyelinating polyneuropathy, multiple sclerosis, Guillan-Barre Syndrome and myasthenia gravis; and including, mastitis, laminitis,

laryngitis, chronic cholecystitis, Hashimoto's thyroiditis, inflammatory breast disease, and chronic inflammation.

16. A composition comprising an algal source of docosahexaenoic acid and a microbial source of astaxanthin.

5 17. The composition of Claim 16 wherein the algae is selected from the group consisting of: *Crypthecodinium*; *Phaedactylum*; *Isochrysis*; *Schizochytrium*; *Thaustochytrium*; or *Ulkenia*,

18. The composition of Claim 16 or 17 wherein the microbial source of astaxanthin is *Haematococcus* or *Pfaffia*.

10 19. The composition of Claims 16-18 further comprising inactivated brewers yeast.

20. The composition of any of claims 16-19 further comprising an anti-inflammatory agent selected from the group consisting of: vitamin C, vitamin E, lycopene,  $\beta$ -carotene, lutein, organic selenium,  $\alpha$ -lipoic acid, methylsulfonylmethane, glutathione, taurine, glycine, glutamine, arginine, 15 cysteine, methionine, S-adenosylmethionine, nucleotides, nucleic acids, curcumin, green tea extract, green-lipped mussel extract (*Perna canaliculus*), or standardised herbal extracts such as *Phyllanthus amarus*, *Fructus Schisandra*, *Chamomile*, *Blacurrent leaf*, *Devil's claw*.

20 21. A feed comprising the nutraceutical according to any of Claims 1-15.

22. A feed comprising the nutraceutical according to any of Claims 1-15 and grass meal.

23. A method of treating an animal suffering from an inflammatory condition or disease comprising administering to said animal an effective amount of at least 25 one long chain polyunsaturated fatty acid and at least one carotenoid.

24. A method according to Claim 23 wherein said long chain fatty acid is a free fatty acid, or an ester thereof.

25. A method according to Claim 23 or 24 wherein said long chain fatty acid is selected from the group consisting of: a triglyceride, diglyceride, monoglyceride, phospholipids, glycolipid, sphingolipid or sulpholipid.
- 5 26. A method according to any of Claims 23-25 wherein said long chain fatty acid is docosahexanoic acid.
27. A method according to any of Claims 23-26 wherein said carotenoid is selected from the group consisting of: astaxanthin, zeaxanthin, lycopene, lutein, or carotene.
- 10 28. A method according to any of Claims 23-27 wherein said animal is administered a further anti-inflammatory agent.
- 15 29. A method according to any of Claims 23-28 wherein said disease or condition is selected from the group consisting of: inflammatory joint diseases e.g. rheumatoid arthritis, osteoarthritis, polyarthritis and gout; chronic inflammatory connective tissue diseases e.g. lupus erythematosus, scleroderma, Sjorgen's syndrome, poly- and dermatomyositis, vasculitis; mixed connective tissue disease (MCTD), e.g. tendonitis, synovitis, bacterial endocarditis, osteomyelitis and psoriasis; chronic inflammatory lung diseases e.g. chronic respiratory disease, pneumonia, fibrosing alveolitis, chronic bronchitis, chronic obstructive pulmonary disease (COPD), bronchiectasis, 20 emphysema, silicosis and other pneumoconiosis and tuberculosis; chronic inflammatory bowel and gastro-intestinal tract inflammatory diseases e.g. ulcerative colitis and Crohn's disease; chronic neural inflammatory diseases e.g. chronic inflammatory demyelinating polyradiculoneuropathy, chronic inflammatory demyelinating polyneuropathy, multiple sclerosis, Guillan-Barre Syndrome and myasthenia gravis; and including, mastitis, laminitis, 25 laryngitis, chronic cholecystitis, Hashimoto's thyroiditis, inflammatory breast disease; chronic inflammation (e.g., caused by an implanted foreign body in a wound); and acute inflammatory tissue damage due to muscle damage after eccentric exercise (e.g., delayed onset muscle soreness – DOMS).

30. A method according to any of Claims 23-29 wherein said animal is selected from the group consisting of: horse; dog; cat ; cow; sheep; goat; camel, llama, mink; pig; hamster; mouse; rabbit; pot bellied pig; rat, gerbil, guinea pig.

31. A method according to any of Claims 23-29 wherein said animal is a human.

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